

WHAT IS CLAIMED IS:

1. A tire having at least one component of a rubber composition comprised of, based upon 100 parts by weight of elastomer (phr),

5 (A) 100 phr of elastomers comprised of:

(1) about 30 to about 70 phr of a styrene/butadiene elastomer composite (SBR Composite) as a composite of styrene/butadiene copolymer rubber (SBR-1) and a functional styrene/butadiene copolymer rubber (SBR-2) which contains at least one silanol and/or siloxy group, with associated pendent hydroxyl and/or alkoxy groups, as a part of the (SBR-2) elastomer chain to thereby provide said elastomer with at least two segments thereof (SBR-2A and SBR-2B) with the silicon atom of said silanol and/or siloxy group between said segments, wherein said SBR Composite is thereby comprised of a polymodal molecular weight configuration comprised about 35 to about 55 weight percent thereof of said (SBR-1) having a number average molecular weight (Mn) in a range of about 200,000 to about 300,000 and, correspondingly, about 65 to about 35 weight percent thereof of said (SBR-2) having a number average molecular weight (Mn) in a range of about 400,000 to 550,000; wherein said SBR Composite contains from zero to a maximum of ten weight percent of at least one additional styrene/butadiene copolymer segment (SBR-3) appended to said silicon atom having an number average molecular weight (Mn) of greater than 550,000; and

(2) at least 30 phr of cis 1,4-polybutadiene rubber, and

(3) from zero to about 15 phr of at least one additional diene-based elastomer selected from cis 1,4-polyisoprene rubber, 3,4-polyisoprene rubber and trans 1,4-polybutadiene rubber, and

25 (B) about 35 to about 100 phr of particulate reinforcement comprised of:

(1) about 35 to about 85 phr of aggregates of precipitated silica comprised of a plurality of individual elementary silica particles, wherein said silicas particles contain hydroxyl groups thereon (e.g. silanol groups);

(2) from zero to about 15 phr of carbon black,

30 (C) a coupling agent as bis(3-triethoxysilylpropyl) polysulfide having an average of from 2 to 2.5 connecting sulfur atoms in its polysulfidic bridge to the

exclusive of a bis(3-trialkoxysilylalkyl) polysulfide having an average connecting sulfur atoms greater than 3 in its polysulfidic bridge.

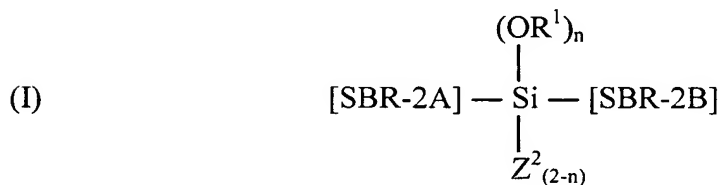
2. The tire of claim 1 wherein said rubber composition contains from 35 to about 55 phr of said 1,3-butadiene rubber and about 5 to about 15 phr of said carbon black.

3. The tire of claim 2 wherein said rubber composition contains from 5 to about 15 phr of at least one of said additional elastomers.

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4. The tire of claim 1 wherein said functional styrene/butadiene elastomer (SBR-2) of the SBR Composite is silicon coupled styrene/butadiene copolymer elastomer of the general Formula (I):

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wherein said [SBR-2A] and [SBR-2B] are individual segments each having a bound styrene content in a range of from about 25 to about 35 percent, a vinyl 1,2-content in a range of about 50 to about 70 percent based on the butadiene component of the respective styrene/butadiene (SBR-2) copolymer, a Tg in a range of about -15°C to about -30°C; wherein the silicon (Si) atom is attached to a butadiene moiety of the respective (SBR-2A) and (SBR-2B); R¹ is selected from selected from hydrogen, methyl, ethyl, propyl, butyl and phenyl groups; and Z² is selected from an additional styrene/butadiene elastomer segment (SBR-3) having content and Tg values of said (SBR-1) and (SBR-2), an alkyl radical containing from 1 to about 18 carbon atoms, or an aromatic radical containing from 6 to about 12 carbon atoms; and where n is a value of from 1 to 2.

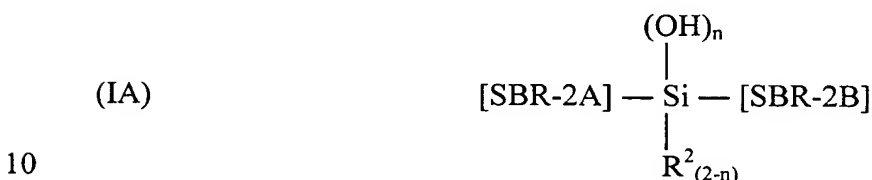
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5. The tire of claim 4 wherein R¹ is selected hydrogen, methyl and ethyl groups; Z² is selected from an additional styrene/butadiene elastomer segment (SBR-3),

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an alkyl radical containing from 1 to about 18 carbon atoms, or an aromatic radical containing from 6 to about 12 carbon atoms; and where n is a value of about 2.

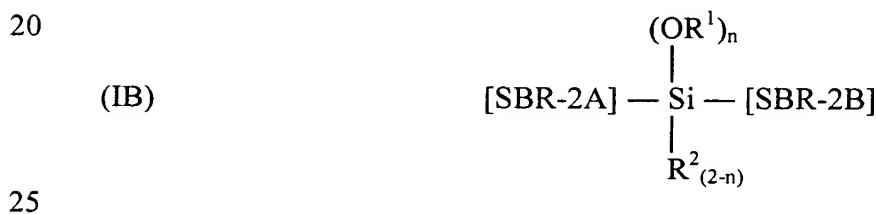
6. The tire of claim 1 wherein said (SBR-2) elastomer is represented as
5 Formula (IA):



wherein R^2 is a radical selected from isopropyl, t-butyl, phenyl or tolyl radicals and n is a value in a range of from 1 to 2.

- 15 7. The tire of claim 6 wherein n is 2.

8. The tire of claim 1 wherein the (SBR-2) elastomer is represented as
Formula (IB):



wherein R^1 is an ethyl radical and R^2 is a radical selected from isopropyl, t-butyl, phenyl or tolyl radicals and n is a value in a range of from 1 to 2.

9. The tire of claim 8 wherein n is 2.
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10. The tire of claim 1 wherein said cis 1,4-polybutadiene rubber is a
branched cis 1,4-polybutadiene rubber having a cis 1,4-content of at least 96 percent
which contains branches of pendent polybutadiene groups along its molecular chain.

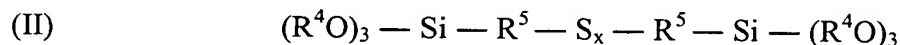
11. The tire of claim 10 therein said branched cis 1,4-polybutadiene is
35 prepared by polymerizing 1,3-butadiene in an organic solvent in the presence of nickel
octanoate, triisobutyl aluminum and the product of hydrogen fluoride para-styrenated

diphenylamine and wherein said branched cis 1,4-polybutadiene has a Mooney viscosity (ML 1+4) at 100°C in its unvulcanized state in a range of about 35 to about 45.

5 12. The tire of claim 1 wherein said precipitated silica is, prior to blending with said elastomer(s):

- (A) pre-treated with an with an alkylsilane of the general Formula (III) prior to blending with said elastomer(s) and said coupling agent;
- (B) pre-treated with a coupling agent of formula (II);
- 10 (C) pre-treated with an organomercaptosilane of formula (IV), or
- (D) pre-treated with a combination of said alkylsilane of Formula (III) with and

- (1) said coupling agent of the general Formula (II) and/or
- (2) said organomercaptosilane of Formula (IV),
- 15 wherein said coupling agent of the general Formula (II) is represented as:



20 wherein R^4 is an alkyl radical selected from at least one of methyl and ethyl radicals, preferably an ethyl radical, R^5 is an alkylene radical having from 1 to 18 carbon atoms, preferably from 2 through 4 carbon atoms, and x is a value in a range of 2 to 8, with an average of from 2 to about 2.6 or from about 3.5 to about 4, preferably from 2 to 2.6;

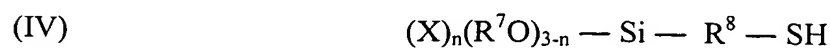
 wherein said alkylsilane of the general Formula (III) is represented as:

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 wherein R^6 is an alkyl radical having from 1 to 18 carbon atoms, n is a value of from 1 through 3; X is selected from chlorine, methoxy and ethoxy radicals, and

30 wherein said organomercaptosilane of the general Formula (IV) is represented as:



wherein X is a radical selected from chlorine, bromine and from alkyl radicals having from one through 4 carbon atoms; wherein R^7 is an alkyl radical having from one through 4 carbon atoms; wherein R^8 is an alkylene radical having from one through 4, carbon atoms; and n is an average value of from zero through 3.

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13. The tire of claim 12 wherein, for said Formula (IV), X is chlorine and R^7 is selected from methyl and ethyl radicals and n is an average value of about 3.

14. The tire of claim 12 wherein, for said Formula (IV), R^7 is an ethyl radical and n is zero.

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15. The tire of claim 12 wherein said alkylsilanes of formula (III) are selected from at least one of the group consisting of trichloromethylsilane, dichlorodimethylsilane, chlorotrimethylsilane, trimethoxymethylsilane, dimethoxydimethylsilane, methoxytrimethylsilane, trimethoxypropylsilane, trimethoxyoctylsilane, trimethoxyhexadecylsilane, dimethoxydipropylsilane, triethoxymethylsilane and diethoxydimethylsilane.

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16. The tire of claim 12 wherein said organomercaptosilanes of formula (IV) are selected from at least one of the group consisting of mercaptomethyltrimethoxysilane, mercaptoethyltrimethoxysilane, mercaptopropyltrimethoxysilane, mercaptomethyltriethoxysilane, mercaptoethyltripropoxysilane, mercaptopropyltriethoxysilane and mercaptopropyltrimethoxysilane.

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17. The tire of claim 2 wherein said particulate reinforcement is present in an amount of from 50 to about 100 phr, said carbon black is present in amount of from about 5 to about 15 phr, said precipitated silica is present in an amount of from 45 to about 85 phr, and wherein about 30 to about 100 weight percent of said carbon black has a DBP value in a range of from 250 to about 600 $\text{cm}^3/100\text{g}$ and an Iodine value in a range of about 500 to about 1050 g/kg with the remainder of the carbon black having a DBP value in a range of from 100 to 200 $\text{cm}^3/100\text{g}$ and an Iodine value in a range of from 90 to 150 g/kg.

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18. The tire of claim 12 wherein said tire is comprised of a component of a rubber composition exclusive of any appreciable content of in situ formed alcohol.

19. The tire of claim 13 wherein said tire is comprised of a component of a
5 rubber composition exclusive of any appreciable content of in situ formed alcohol.

20. The tire of claim 18 wherein said component is a tire tread.